SERVICE MANUAL

Climate Control

MANUFACTURING

- All cast iron wear surfaces (including permanent cast iron cylinder liners, cast iron piston rings, cast iron crankshaft and cast iron shaft seal plate).

- High load ball bearings (no needle bearings or sleeve bushings are utilized).

- High strength aluminum alloy pistons and connecting rods permanently secured by steel wrist and dowel pins.

- Swedish steel reed valve assemblies, highly finished for maximum performance as well as maximized orifice porting to reduce the effects of liquid slugging.

- Value added features like a generously lubricated shaft seal area, high quality steel head gaskets and the widest selection of compressor service valves available.

- Large oil sump produces a unique splash lubrication system that allows the compressor to be self-lubricating regardless of the amount of oil mixed with refrigerant.

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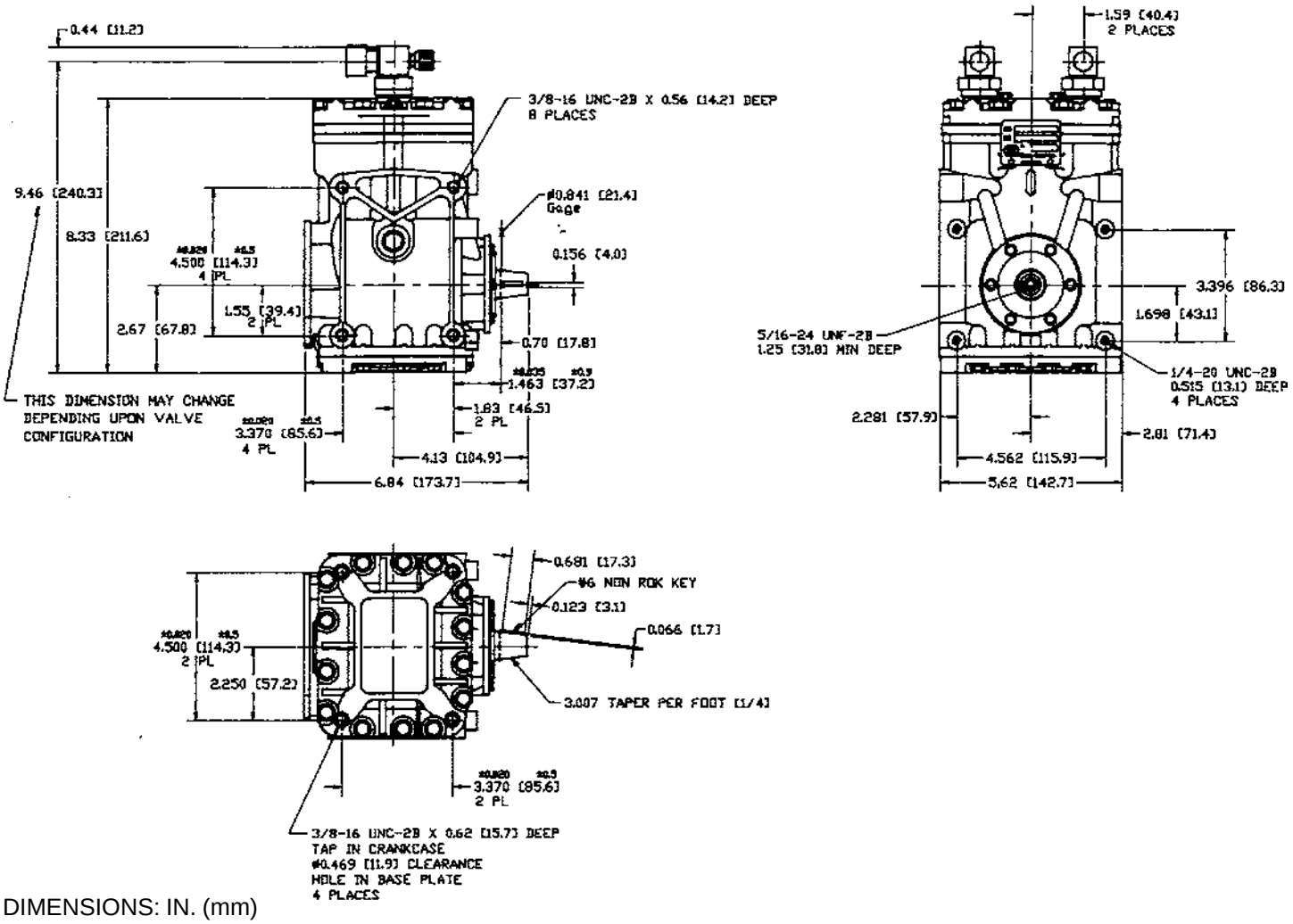
Compressor Specifications

Heavy Duty Models



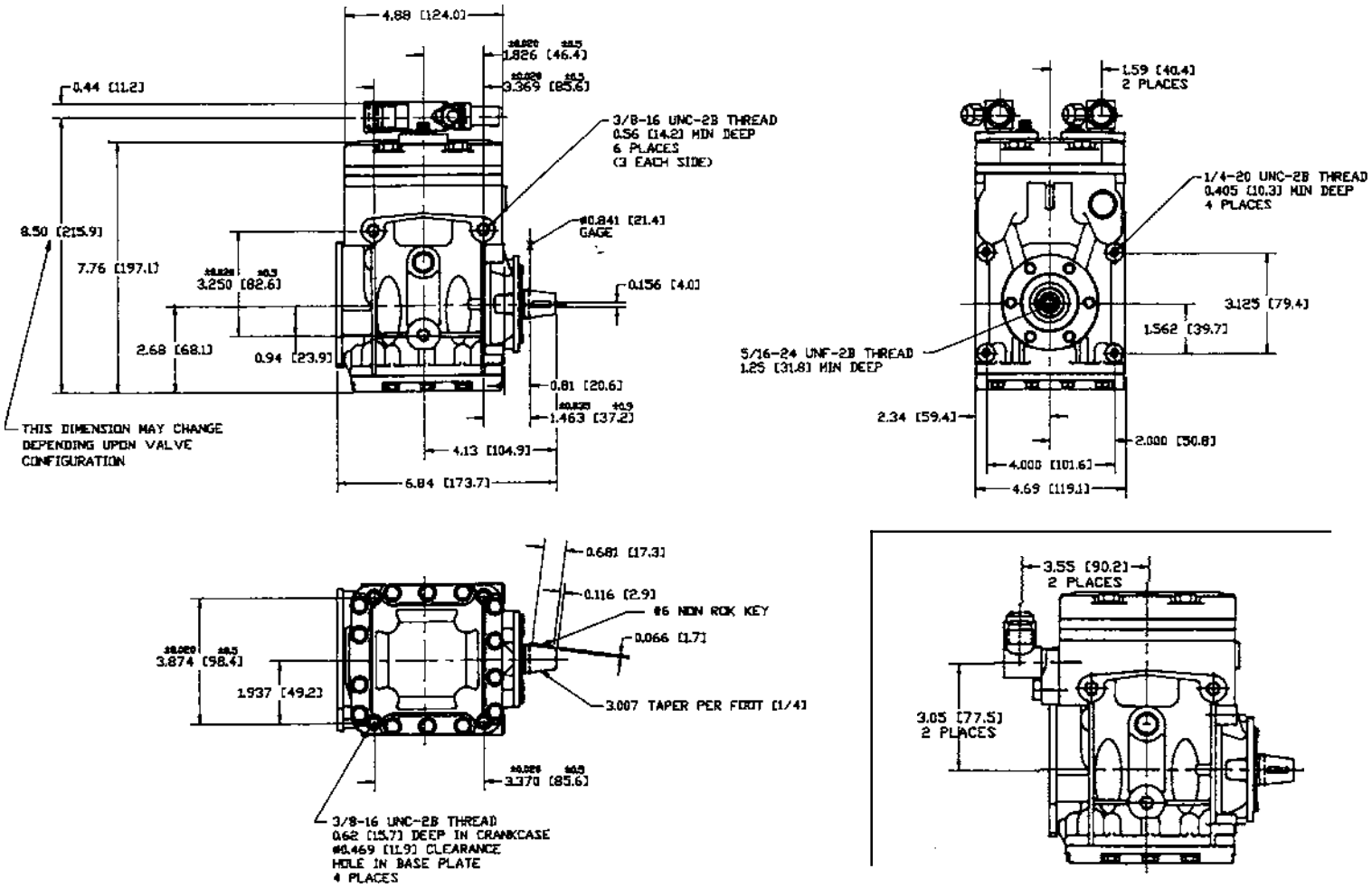
DIMENSIONS: IN. (mm)

SPECIFICATIONS	206	209	210
No. Cylinders	2	2	2
Bore, in. (mm)	1.875 (47.63)	1.875 (47.63)	1.875 (47.63)
Stroke, in. (mm)	1.105 (28.07)	1.573 (39.95)	1.866 (47.40)
Disp., cu. in./rev. (cc/rev)	6.10 (100)	8.69 (142)	10.3 (169)
R.P.M. - Max.	6000	6000	6000
Refrigerant	R-12, 22, 502, 134a & new blends	R-12, 22, 502, 134a & new blends	R-12, 22, 502, 134a & new blends
Initial Oil Charge, fl. oz. (ml)*	14 (413)	14 (413)	14 (413)
Weight, lbs. (kg)	14.6 (6.6)	14.6 (6.6)	14.6 (6.6)
Lubrication	Splash and Positive Pressure and Oil Return Through Suction Side		

*R-12 Heavy Duty models contain 12 fl. oz. (355 ml).*R-134a Heavy Duty models contain 14 fl. oz. (413 ml). Some OEM specifications are as high as 17 fl. oz. (503 ml).

Compressor Specifications

Super-Compact ("Mini") Models



DIMENSIONS: IN. (mm)

NOTE: Super-Compact models are designed to have the fittings on the top or from the rear (low profile).

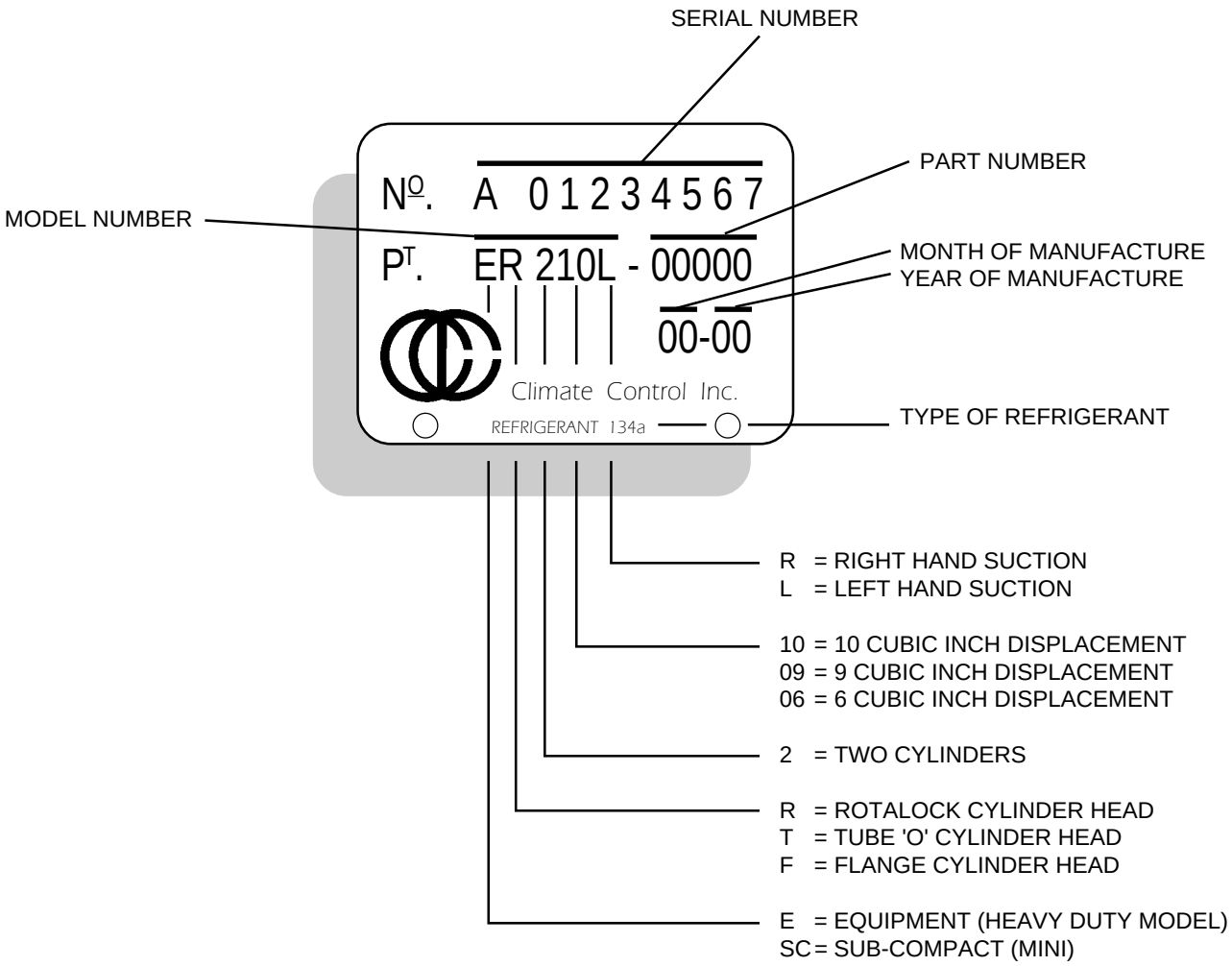
SPECIFICATIONS	SC 206	SC 209
No. Cylinders	2	2
Bore, in. (mm)	1.875 (47.63)	1.875 (47.63)
Stroke, in. (mm)	1.105 (28.07)	1.573 (39.95)
Disp., cu. in./rev. (cc/rev)	6.10 (100)	8.69 (142)
R.P.M. - Max.	6000	6000
Refrigerant	R-12, 22, 502, 134a & new blends	R-12, 22, 502, 134a & new blends
Initial Oil Charge, fl. oz. (ml)*	12 (355)	12 (355)
Weight, lbs. (kg)	13.0 (5.9)	13.3 (6.0)
Lubrication	Splash and Positive Pressure and Oil Return Through Suction Side	

*Some OEM specifications are as high as 15 fl. oz. (444 ml).

Compressor Identification

The metal nameplate located at the top front of the compressor serves as a means of identification. The location permits viewing the nameplate with the clutch installed.

Data inscribed on the nameplate includes the serial number, combination model/part number, date of manufacture, and type of refrigerant.


SERIAL NUMBER
PART NUMBER
MODEL NUMBER
MONTH OF MANUFACTURE
YEAR OF MANUFACTURE
TYPE OF REFRIGERANT
NO. A 0 1 2 3 4 5 6 7
PT. ER 210L - 00000
00-00
Climate Control Inc.
REFRIGERANT 134a
R = RIGHT HAND SUCTION
L = LEFT HAND SUCTION
10 = 10 CUBIC INCH DISPLACEMENT
09 = 9 CUBIC INCH DISPLACEMENT
06 = 6 CUBIC INCH DISPLACEMENT
2 = TWO CYLINDERS
R = ROTALOCK CYLINDER HEAD
T = TUBE 'O' CYLINDER HEAD
F = FLANGE CYLINDER HEAD
E = EQUIPMENT (HEAVY DUTY MODEL)
SC = SUB-COMPACT (MINI)

Features

TRUE UNIVERSAL MOUNT — Can be installed and operated in any position from horizontal left to horizontal right as received. No field adjustments are necessary. If the compressor is mounted horizontally, the suction side should be on top.

UNIVERSAL ROTATION — Compressor rotation can be clockwise or counter-clockwise. No field adjustments are necessary.

LUBRICATION SYSTEM — A splash lubrication system provides more than adequate lubrication to the front and rear crankshaft bearings, connecting rods and cylinder walls. Positive pressure differential between the crankcase and the suction intake is utilized to provide lubrication to the front shaft seal.

TWO OIL PLUGS — One on each side of the crankcase, permits easy checking of crankcase oil level regardless of mounting position.

EXTERNAL CLUTCH MOUNT — Four bosses on the seal end of the crankcase provide accommodation for mounting the clutch. Simplifies field replacement of compressor shaft seals.

SERVICEABILITY — All components readily accessible and removable with standard tools.

- Crankcase — Light weight die cast noncorrosive aluminum.
- Cylinder Liners — Cast iron, permanently cast into crankcase body. Precision honed finish.
- Head — Die cast aluminum.
- Base — Die cast aluminum.
- Piston — Die cast aluminum fitted with cast iron piston rings for optimum wear.
- Connecting Rods — Die cast aluminum, heavy cross section, super-finished surfaces, assembly doweled for positive alignment.
- Crankshaft — Cast ductile iron. Large connecting rod and main bearing areas.
- Bearings — High load capacity ball type bearings for longer life at heavy loads and high speed.
- Valves — Swedish steel suction and discharge valves mounted on ground valve plate.
- Shaft Seal — Carbon face seal specially designed for high speed operation.
- Gaskets — Neoprene composite fiber gaskets used to seal base plate and valve plate. Rubber coated metal gaskets used to seal cylinder head.

Installation

The compressor mounting bracket must be rigidly secured to the vehicle engine. It is recommended to use at least six 3/8" - 16 UNC bolts of proper length to secure the compressor to the mounting brackets. Mounting with the side mounting holes is preferred over the bottom mounting holes. Lock washers must be used with all mounting bolts.

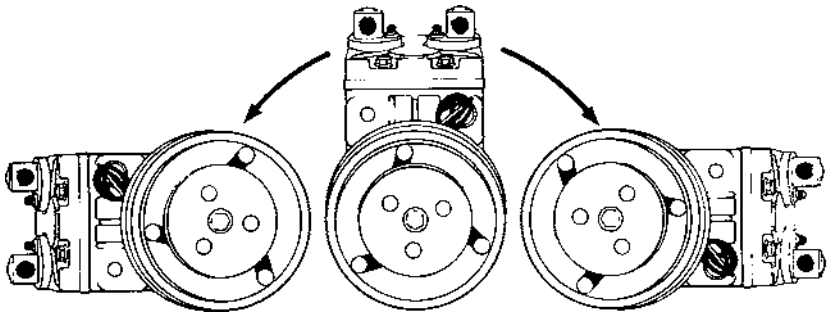
Refer to pages 2 and 3 for compressor dimensions and physical data.

Very important factors in compressor installation are correct pulley alignment and proper belt tension. The compressor flywheel, or clutch, must be in perfect alignment with the drive pulley on the engine and any auxiliary idler or belt adjustment pulley arrangements. It is important to be sure that the shaft key is in place on the shaft and the flywheel bolt is drawn tight, when installing a flywheel or clutch. The pulley alignment may be checked by holding a 1/2" dia. (12-13 mm) rod - 2 to 3 feet (0.6 to 0.9 m) long - firmly in the V groove of the flywheel or clutch making sure the rod falls squarely in the driver pulley grooves. A further check may be made by seeing that the belt, as it goes from pulley to pulley, comes off the pulley grooves perfectly straight and that there are no side-way bends in the belt, as it approaches or leaves the pulleys. Only high quality reinforced belts should be used.
The belt tension adjustment should be made so the belt is taut, but not too taut to create excessive bearing loads. Due to the pulsating load created by the compressor, the belt tension must be greater than for a normal steady load. Belt tension can be accurately determined with the use of a belt tension gauge which gives a direct reading of belt load as determined by the deflection. A belt tension of 100-120 lbs. (45-54 kg) is considered normal.

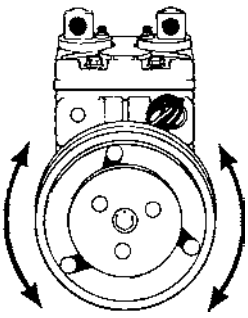
After approximately 30 minutes of operation time, the belt should stretch to a normal operation point and a further check for proper tension should be made. Good alignment and belt tension are important to insure long belt life, quiet operation, and to maintain top system performance.

The discharge and suction line connections must be made to the proper compressor service valves or fittings. The word DISCH. on the cylinder head designates the discharge service valve port. The word SUCTION on the cylinder head designates the suction service valve port. Because the compressor will move, or float, with the engine upon acceleration, rigid connections to the compressor should be avoided, and suitable flexible refrigerant lines, which will permit compressor movement without causing excessive tubing strain, should be used.

180 degree, left to right orientation



Clockwise or counterclockwise rotation



NOTE: CCI recommends that when positioning compressor at full 90° horizontal, suction side should be on "top".

Inspection

OIL CHARGE

If the quantity of oil is unknown, the compressor oil level must be checked at the time of installation and again after the system has been fully charged with refrigerant and the system has been operated and balanced out to the desired compartment interior temperature.

Make the initial oil level check after the compressor is mounted on the mounting bracket and before initial refrigerant charge.

Remove one oil fill plug with its “O” ring, either plug on a vertical mount installation, the upper plug on horizontal mount installations.

LEFT HAND MOUNTING:
CHECK OIL WHEN NON ROK SHAFT KEY IS DOWN.

RIGHT HAND MOUNTING:
CHECK OIL WHEN NON ROK SHAFT KEY IS UP.

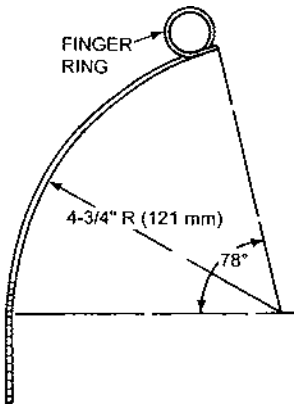


FIG. 1-OIL DIP STICK

The oil dip stick, Fig. 1, can be made locally (or purchased, page 15) and is suitable for use on all compressors in any mounting position. If made locally, it can be formed from 1/8" dia. X 8-5/16" (3 mm dia x 210 mm) long stock, preferably non ferrous material which is not subject to corrosion. Notched ends are helpful in visibly detecting the oil depths.

OIL TYPE

When adding or changing oil, use only proper oil. Keep the oil storage container tightly capped at all times.

Refrigerant	**Acceptable Lubricants**
R-12, R-22, R-502	Mineral Oil, Zerol 150, Zerice S-68, P.O.E.
R-134a	Polyol Ester (P.O.E.) P.A.G.
Other Refrigerants	Consult Factory

The Table below shows the crankcase oil charge in fluid ounces (and ml) at various dip stick measurements for both horizontal and vertical mounts. The oil charge after the system is stabilized should be maintained with 6 fluid ounces (177 ml) minimum and 8 to 12 fluid ounces (237 to 355 ml) for best results.

OIL CHARGE vs. DIP STICK DEPTH

HEAVY DUTY & STANDARD MODELS

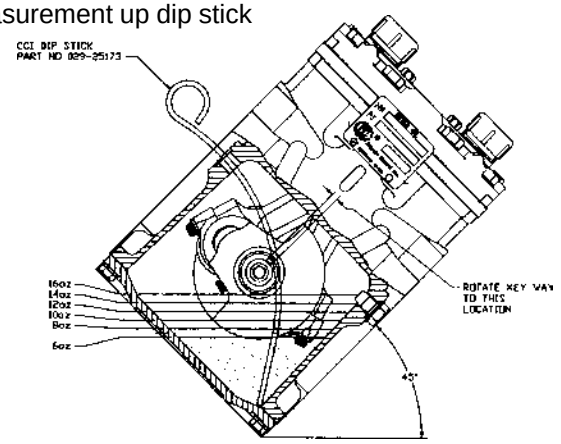
	Horizontal Mount	Vertical Mount	*45° Mount
6 fl. oz. (177 ml)	13/16" (21 mm)	7/8" (22 mm)	1 5/8" (41 mm)
8 fl. oz. (237 ml)	1" (25 mm)	1" (25 mm)	1 13/16" (46 mm)
10 fl. oz. (296 ml)	1-3/16" (30 mm)	1-1/8" (29 mm)	2" (51 mm)
12 fl. oz. (355 ml)	1-5/8" (41 mm)	1-7/16" (37 mm)	2 1/4" (57 mm)
14 fl. oz. (414 ml)	1-13/16" (46 mm)	1-11/16" (43 mm)	2 7/16" (62 mm)
16 fl. oz. (473 ml)	1-15/16" (49 mm)	1-7/8"` (48 mm)	2 5/8" (67 mm)

SUPER COMPACT ("MINI") MODELS

	Horizontal Mount	Vertical Mount
6 fl. oz. (177 ml)	3/4" (19 mm)	1" (25 mm)
8 fl. oz. (237 ml)	1" (25 mm)	1-1/4" (32 mm)
10 fl. oz. (296 ml)	1-3/16" (30 mm)	1-1/2" (38 mm)
12 fl. oz. (355 ml)	1-7/16" (37 mm)	1-13/16" (46 mm)
14 fl. oz. (414 ml)	1-3/4" (44 mm)	2-1/16" (52 mm)

*OIL LEVEL AT 45°

Measurement up dip stick



The compressor oil level should never be permitted to go below the minimum oil level of 6 fluid ounces (177 ml). If oil must be added, the oil should be added until the level is 12 fluid ounces (355 ml). An excessive amount of oil is detrimental to the proper functioning of the entire system.

If a compressor replacement is made on a system which has been in operation, the oil charge of the new compressor should not exceed 12 fluid ounces (355 ml), unless specified by the OEM manufacturer.
When inserting the oil fill plug, the sealing “O” ring is slipped over the oil fill plug threads in such a manner that the “O” ring is not twisted. Insert the oil plug in the oil fill opening and tighten the plug snug. If the plug leaks, do not attempt to stop the leak by over tightening the oil check plug. A leak may be caused by dirt under the “O” ring or on the seat, a fractured “O” ring, or a damaged seat on the oil fill plug or oil fill opening. To stop leaks at the oil fill plug, correct the mechanical damages and insert a new “O” ring.

It must be remembered that the 206, 209 and 210 models are high speed compressors and satisfactory operation depends on proper lubrication.

LEAK CHECK EQUIPMENT

Most of the electronic leak checkers now on the market are capable of locating very small refrigerant leaks. Since open type bolted and flanged compressors have a permissible leak rate of one ounce per year, it then becomes quite important that the leak check equipment used be calibrated to pick up only those leaks which are in excess of the permissible one ounce per year limit. Since shaft seals depend upon oil for lubrication and sealing, it is quite natural to find oil in the shaft cavity.

This oil is heavily laden with refrigerant and electronic equipment would pick up this refrigerant and indicate it as a leak. When checking the shaft seal for leakage, the refrigerant-laden oil must first be flushed from the seal cavity with a solvent which does not affect the operation of the electronic leak equipment. Caution: some of the more common solvents contain chemical compositions which affect the operation of the leak detector equipment.

The major point to consider in any electronic type leak detection equipment is to be able to positively calibrate the equipment to the permissible leak rate and then to use the equipment as explained by its manufacturer. The speed at which the probe is moved is very important in locating the larger than permissible leaks.

EVACUATION, LEAK TESTING, ADJUSTMENT

The instructions contained in the installation and service manual of the air conditioning system manufacturer should be followed in evacuating and charging the system and for adjustment of all controls.

After charging, the entire system should be checked for leaks with a leak detector.

ROTATION-SPEED

The compressor may be operated in either a clockwise or counter-clockwise direction of rotation. No field adjustments are necessary. The compressor is designed for operation between 500 and 6,000 rpm maximum. (4000 rpm continuous rating).

Service

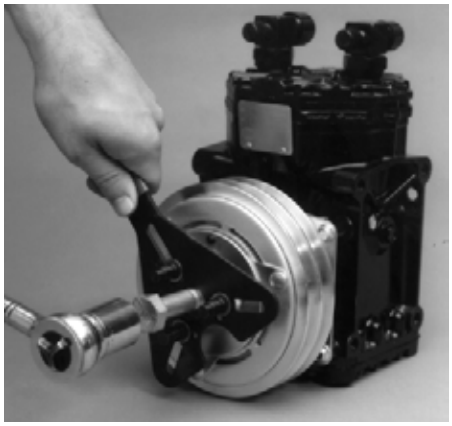
The majority of compressor parts are made up of aluminum alloys and care must be taken in handling not to mar, nick or scratch. All machined surfaces must be free of nicks and burrs to insure proper fit and gasket seating. When replacing parts and securing with bolts or cap screws, the specified torque requirements on page 15 should never be exceeded. Bolts should all be run in until the bolt heads make contact, then tightened with a torque wrench in a sequence resulting in tightening of diagonally opposite bolts until all are drawn up to specified torques. (Refer to torque sequence page 15.)

An important factor in compressor servicing is cleanliness and care should be exercised to prevent dirt or foreign material from entering the compressor when it is opened. All old gaskets should be removed and replaced. All gasket surfaces should be clean and all parts to be reused should be washed in a suitable petroleum base solvent.

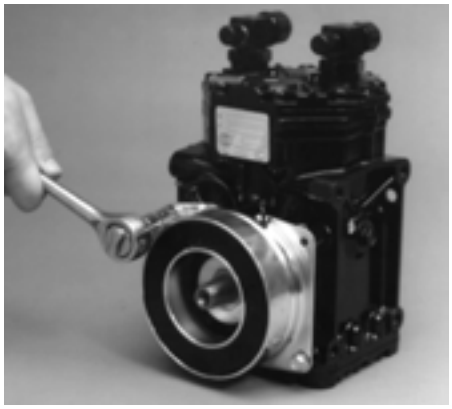
CLUTCH SERVICING

REMOVAL

1. Remove the clutch center bolt and washer using the adjustable spanner wrench to hold the clutch pulley.



2. Install clutch removal bolt into the clutch. Using the adjustable spanner wrench to hold the clutch pulley in place, tighten the clutch bolt until the clutch pulley is forced free.

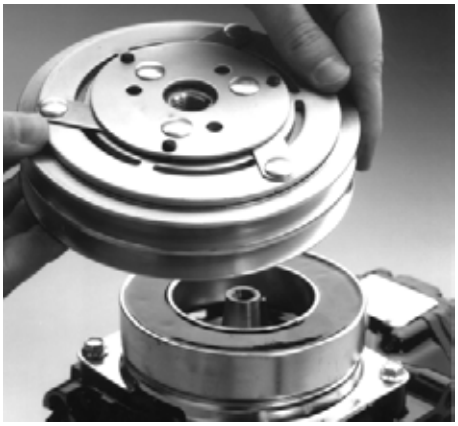


3. Remove the clutch mounting bolts.

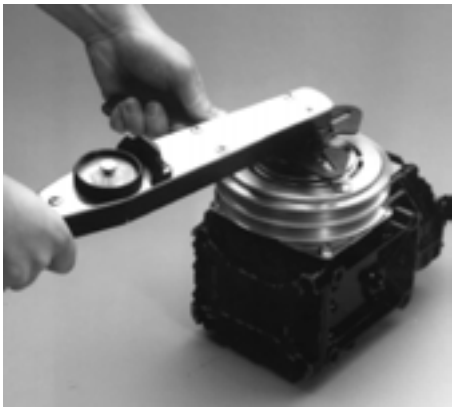
INSTALLATION

1. Check that a key is properly inserted in the shaft of the compressor.

2. Mount and center the coil bracket. Tighten the four clutch mounting bolts using a torque wrench to 13-19 ft. lbs. (17.6-25.8 N-m). NOTE: Only use bolts that have a loctite patch on the threads.



3. Place clutch pulley over shaft making sure to align the key way over the shaft key.



4. Install and tighten the clutch center bolt and washer using a torque wrench to 20-25 ft. lbs. (27.1-33.9 N-m).

5. Spin the clutch pulley to verify there is no interference. Verify the clutch engages when the proper voltage is applied.

SHAFT SEAL SERVICING

The shaft seal assembly of the CCI compressor is of a simplified design, yet tight sealing, long lasting and, when necessary, easily and quickly replaced. CCI seals are machined to 3 helium light bands of flatness. The carbon is lapped to the seal plate and the fit becomes even better as the seal assembly is "run in" during operation.

The tendency to condemn a seal assembly because of very slight leakage is an error that is often committed. Few if any mechanical seal assemblies are 100% tight. The rubbing surfaces of the seal are separated by a very fine film of oil.

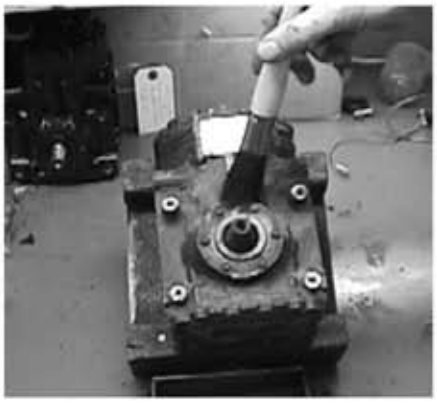
Oil carries refrigerant and minute quantities which seep to the outside may be detected with ultra sensitive leak detectors which are capable of sensing leakage totalling one ounce of refrigerant over a twenty year period. Such sensitivity serves a useful purpose in critical applications but for leak testing compressor joints or seal, a leak detector will pick up any leak of sufficient magnitude to require correction. Refer to comments on leak detector equipment, page 8.

Do not be too prone to condemn and replace a seal assembly until the seal has been given an opportunity to "run in" and until there is definite proof that replacement is really necessary.

If a refrigerant leak from the area behind the compressor clutch is verified with a refrigerant leak detector, replacement of the compressor shaft seal is recommended. Note: Up to a few drops of compressor oil may normally be found in the area under the front seal. Do not replace a seal based on the presence of small amounts of oil. Verify a leak with a refrigerant leak detector before replacement, then proceed as follows:

REMOVAL

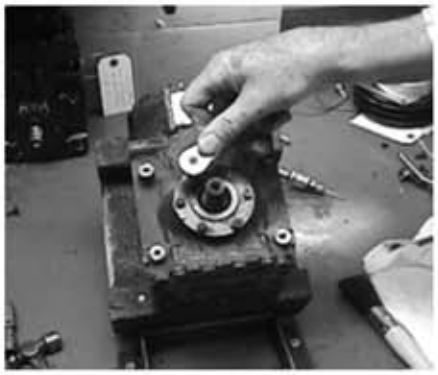
1. Remove the compressor and place on work bench.



2. Brush off debris and dirt.

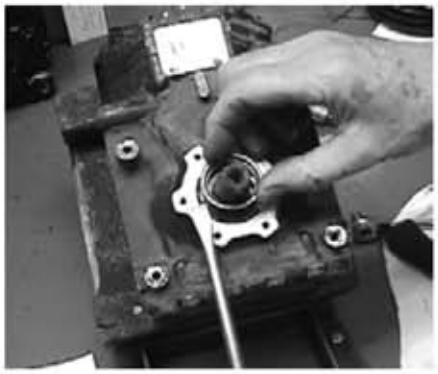
3. Use a clean lint free shop cloth to wipe clean the exposed end of the crankshaft.

4. Use Climate Control Seal Kit 488-25274



5. **Caution!** Prior to removing the seal plate screws, be certain that any compressor internal pressure has been relieved!

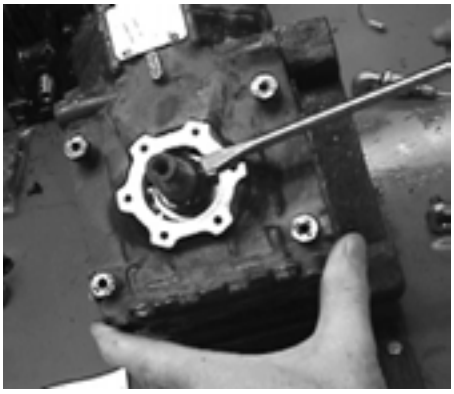
Remove the screws that hold the seal plate in place and lift plate from the compressor.



6. Using a flat blade screw driver, or similar tool, pry up and remove the seal retainer assembly. Use care not to scratch or mar the crankshaft or the machined face of the compressor.

7. In nearly every case the friction ring (boot) will not come off with the seal retainer assembly.

NOTE: The shaft seal in this design is a carbon face seal which is designed to trap oil between the stationary metal plate and the rotating carbon ring. To maintain the integrity of the shaft seal it is recommended to rotate the shaft every three to six months.



8. With the tool used to remove the seal retainer assembly, carefully pry up and remove the friction ring (boot). Again, use care not to scratch or mar the crankshaft or machined face of the compressor.

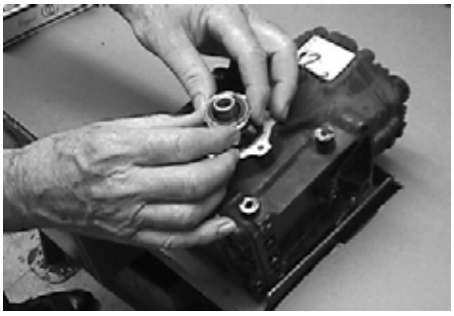
INSTALLATION

1. Use a clean, lint free shop cloth to wipe the crankshaft clean. Note: At this time the front main bearing is exposed, therefore care must be taken to prevent dirt or any type of contamination from falling into it.

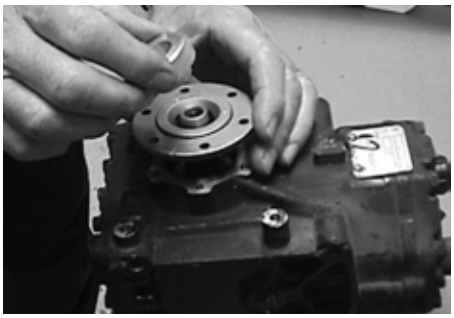
2. Apply clean refrigerant oil to the seal plate “O” ring and place the ring into the seal plate “O” ring groove. Invert the plate and observe that the “O” ring remains in place.

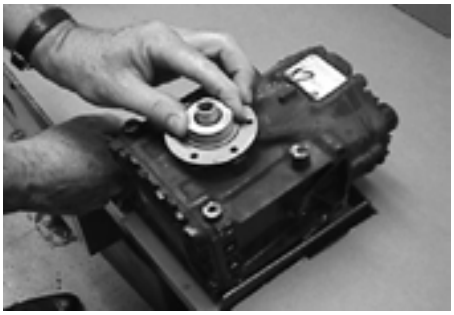
3. Place a few drops of clean refrigerant oil on the face of the seal plate between the "O" ring and the inside diameter and with a clean finger spread the oil into a thin film. It is important that the surface not be over oiled and that there is no oil between the "O" ring groove and the outside diameter of the seal plate.

4. Apply clean refrigerant oil around the entire exposed end of the crankshaft. With a clean finger, uniformly spread the oil completely over the surface. Again, take care that no dirt or contamination falls onto he main bearing.



5. Prior to installation, check the seal assembly to make sure that the carbon seal ring is right side up (narrow polished band up), and confirm that the carbon rings notches are aligned with the drive tabs in the metal seal retainer. Lightly place the seal assembly (carbon ring side up) onto the oiled crankshaft.

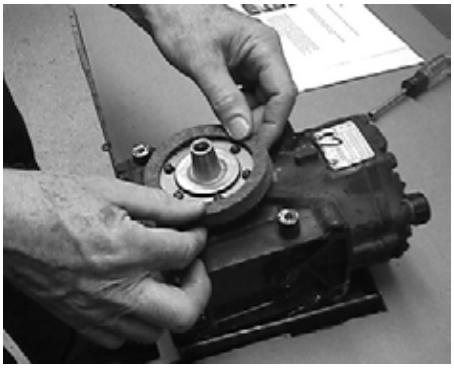




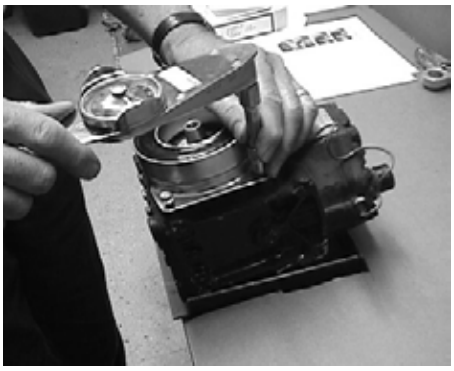
6. Insert the alignment tool into the seal plate and lightly place the plate’s polished face into contact with the seal assembly. With a uniform downward motion, use the alignment tool to push the seal plate into contact with

the crankcase face. Continue to hold pressure between the seal plate and the crankcase face while aligning and installing the six (6) hold down screws. Use a nut driver or similar tool for initial tightening. **Failure to hold the seal plate against the crankcase face until all screws are firm against the seal plate may result in a chipped or broken carbon ring.** Remove the centering tool and use a star pattern sequence to tighten the six (6) screws to a finish torque of 5-8 ft. lb.
(7-11 N-m).

7. Install the metal dust cover, tapping it firmly into place.



8. Install felt ring dust shield, placing it around the seal plate and tight against the compressor housing.

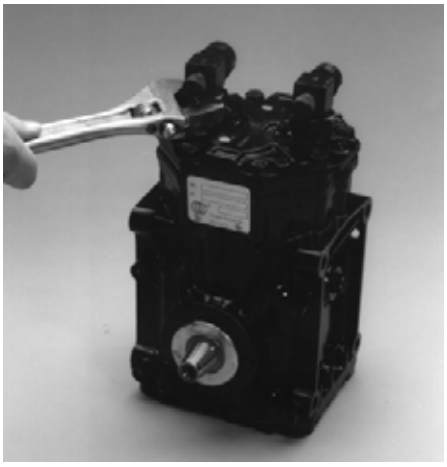


9. Reinstall the clutch, using the four new screws supplied with the seal kit to attach the field coil assembly, tighten these screws to 13-19 ft.lb. (18-26 N-m). Install the clutch armature/pulley assembly and tighten the center bolt to 20-25 ft.lb. (27-34 N-m) Insure that the pulley spins freely. Remove the caps from the suction and discharge ports, and using the tool that tightened the center bolt, rotate the compressor six (6) to ten (10) revolutions to seat the carbon ring uniformly against the seal plate. Replace the suction and discharge port caps.

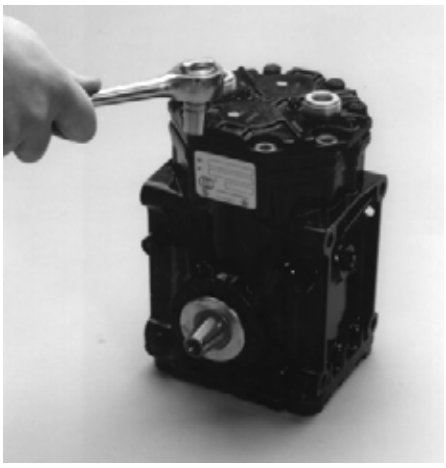
HEAD AND VALVE PLATE SERVICING

Prior to servicing the head and valve plate, both service valves should be opened to free any gas pressure which may be in the compressor. The cylinder head is made of aluminum and care should be taken when removing it not to damage the sealing surfaces.

REMOVAL



1. Remove the screws from flanged type service valves. Note that these four screws are longer than the remaining head screws. If the valves are of the Rotalock type or Tube 'O' type, remove by loosening the hex nuts which are a part of the valve assembly.



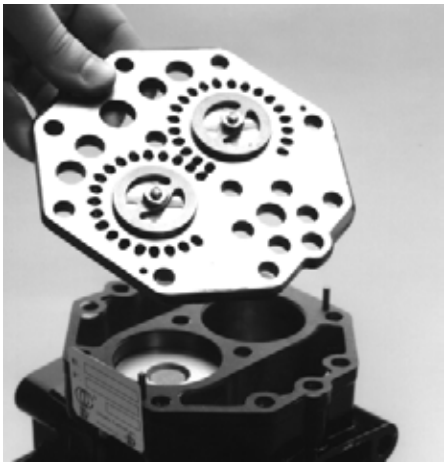
2. Remove the remaining screws in the head and remove the valve plate and head from the cylinder by prying or tapping under the ears which extend from the valve plate. If the head and valve plate adhere, hold the head and tap the valve plate ears away from the head with a soft hammer. Do not hit or tap the head to separate the head and valve plate because damage to the head may result.

3. All gasket material adhering to the head, valve plate, or crankcase; should be carefully removed in such a manner that the machined sealing surfaces are not scratched or nicked.

INSTALLATION

Valves and valve plates are furnished only as a complete assembly.

1. Apply a thin film of clean refrigeration oil on the area of the crankcase to be covered by the crankcase gasket. Place the cylinder gasket in position on the cylinder so the dowel pins in the crankcase go through the dowel pin holes in the cylinder gasket.



2. Apply a thin film of clean refrigeration oil to the top and bottom valve plate areas to be covered by gaskets. Place the valve plate in position on the cylinder gasket so the discharge valve assemblies (i.e. the smaller diameter assemblies with the restrainer over the valve reed) are facing up and the locating dowel pins go through the dowel pin holes in the valve plate.

3. Place the head gasket, with the bead facing up, in position on the valve plate so the dowel pins go through the dowel pin holes in the gasket.

4. Apply a light film of clean refrigeration oil on the machined surface of the cylinder head which matches the head gasket. Place the head on the cylinder head gasket so the dowel pins go into the dowel pin holes in the head.

5. For a flange head, apply a thin film of clean refrigeration oil to the service valve flanges. Place an oiled service valve O-ring or gasket in position on the cylinder head service valve flanges. Place the service valves in position on the proper service valve ports (suction or discharge) and insert the four longer screws through the service valve mounting pads, the head, the valve plate, and into the crankcase. For a Tube 'O' or Rotalock head, insert the longer torx screws on the inside of the service valve ports and the shorter torx screws on the outside. Insert the remaining head screws and run in all the screws until the heads make contact. Tighten the head and service valve screws (using a torque wrench) to 17-25 ft. lbs. (23.0-33.9 N-m) in sequence as shown on torque sequence chart, page 15.

BASEPLATE SERVICING

REMOVAL

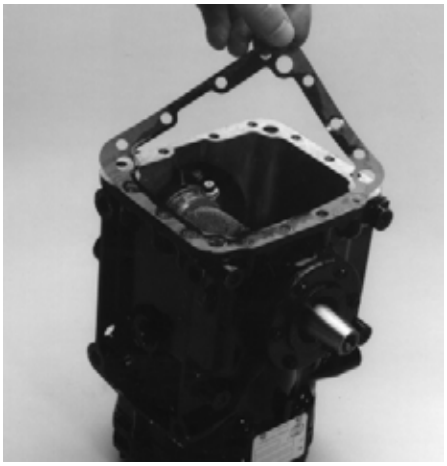
1. Remove the baseplate bolts.

2. Remove baseplate and gasket. If the baseplate is stuck, lightly tap the edges of the baseplate with a soft hammer.

3. Remove any gasket material adhering to the baseplate or crankcase. This should be done in a manner such that the sealing surfaces are not scratched or nicked.

INSTALLATION

1. Apply a thin film of refrigeration oil to a new gasket and the sealing surface of the crankcase and baseplate.



2. Properly align the gasket on the crankcase.

3. Install the baseplate and bolts. Tighten baseplate bolts to 10-16 ft. lbs. (13.6-21.7 N-m) in sequence given on page 15 using a torque wrench.

GASKET TREATMENT

Before assembly to the compressor, all gaskets should be dipped in clean refrigeration oil of the type used in the crankcase.

Gaskets are made of a neoprene composition fiber and wicking action will result as oil follows the fiber. Do not mistake this wicking action for leaking. Wicking is a normal condition and is to be expected.

NOTES ON NOISE COMPLAINTS

Many of the noise complaints can be traced to mount and drive and other related component problems. Normally if the unit is noisy at one speed and this noise clears up at another, it is not usually due to the compressor. Each vehicle has its critical frequencies where all vibrations get into the correct harmony to generate sound or noise. The speed at which these critical points are found will vary with each vehicle and each mount and drive arrangement. By changing the mount and drive components the noise level may be reduced.

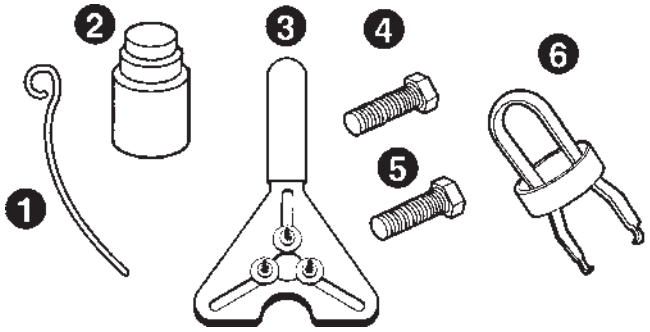
Many times the noise generated can be eliminated or greatly reduced by changing the belt adjustment to a different tension. A tension of 100 -120 lbs. (45-54 kg) is considered normal.

Noises emanating from the clutch are difficult to recognize because of the close connecting feature with the compressor. A loose bolt holding the clutch to the shaft will result in extremely noisy operation. Extreme care must be exercised to prevent the removal of the wrong component.

Since a compressor has many moving parts, it is normal for it to generate some noise just as a motor generates some noise as it is operated. The refrigerant gases, as they are moved by the compressor pistons, also produce noises and vibrations as a normal situation.

CLASSIC # 22-1272

CCI (YORK) ESSENTIAL SEAL TOOL KIT



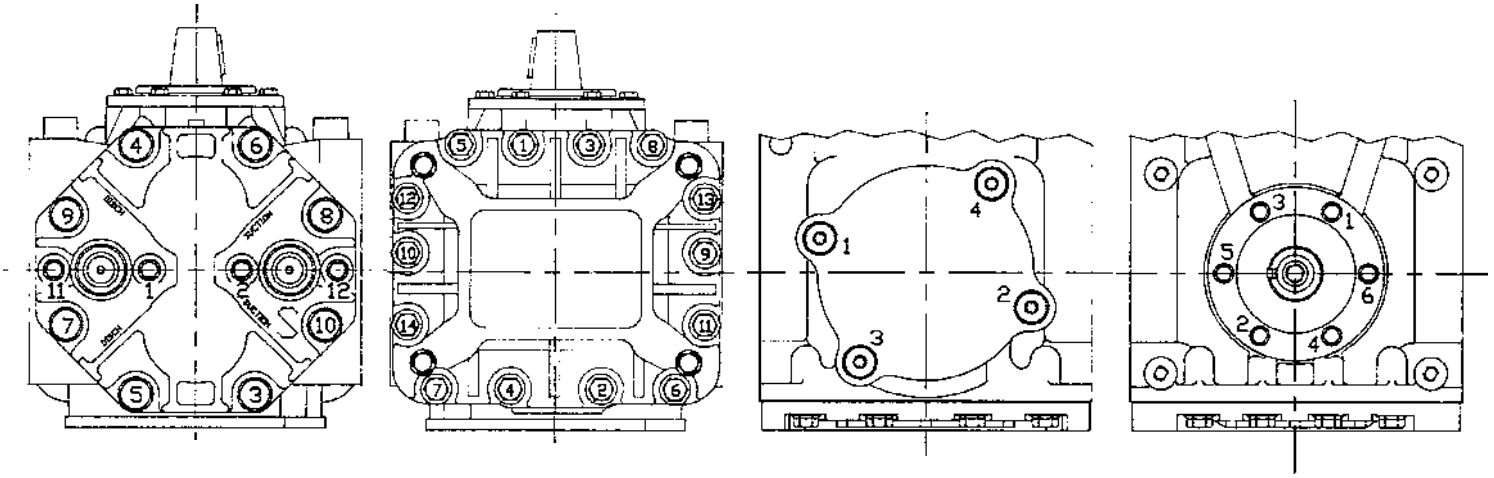
1. 99-431 - CCI and Tecumseh Oil Level Checker
2. 99-474 - Seal Installer and Plate Alignment Tool
3. 99-499 - Universal Clutch Holder Wrench
4. 99-440 - Clutch Remover 5/8 x 11 Thread (CCI and Tecumseh)
5. 99-441 - Clutch Remover 5/8 x 18 Thread (CCI and Tecumseh)
6. 99-473 - Universal Seal Remover

BASIC COMPRESSOR TOOLS AVAILABLE THROUGH:

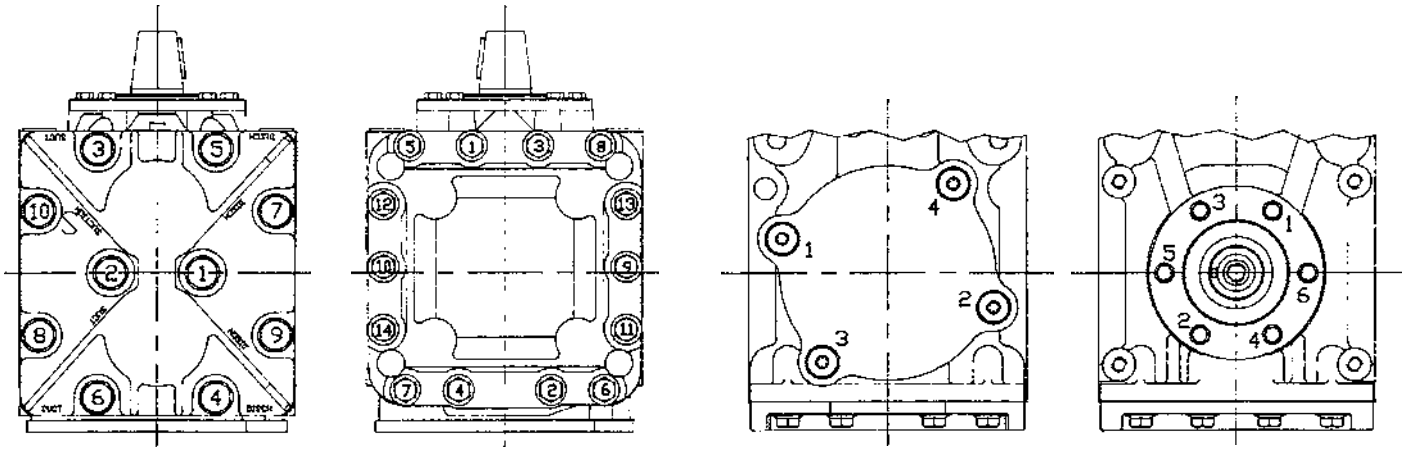
CLASSIC TOOL DESIGN, INC. 31 WALNUT STREET • NEW WINDSOR, NY 12553
PH. 914-562-8700 • FAX 914-562-8596

Torque Sequence and Specifications

Heavy Duty and Standard Models

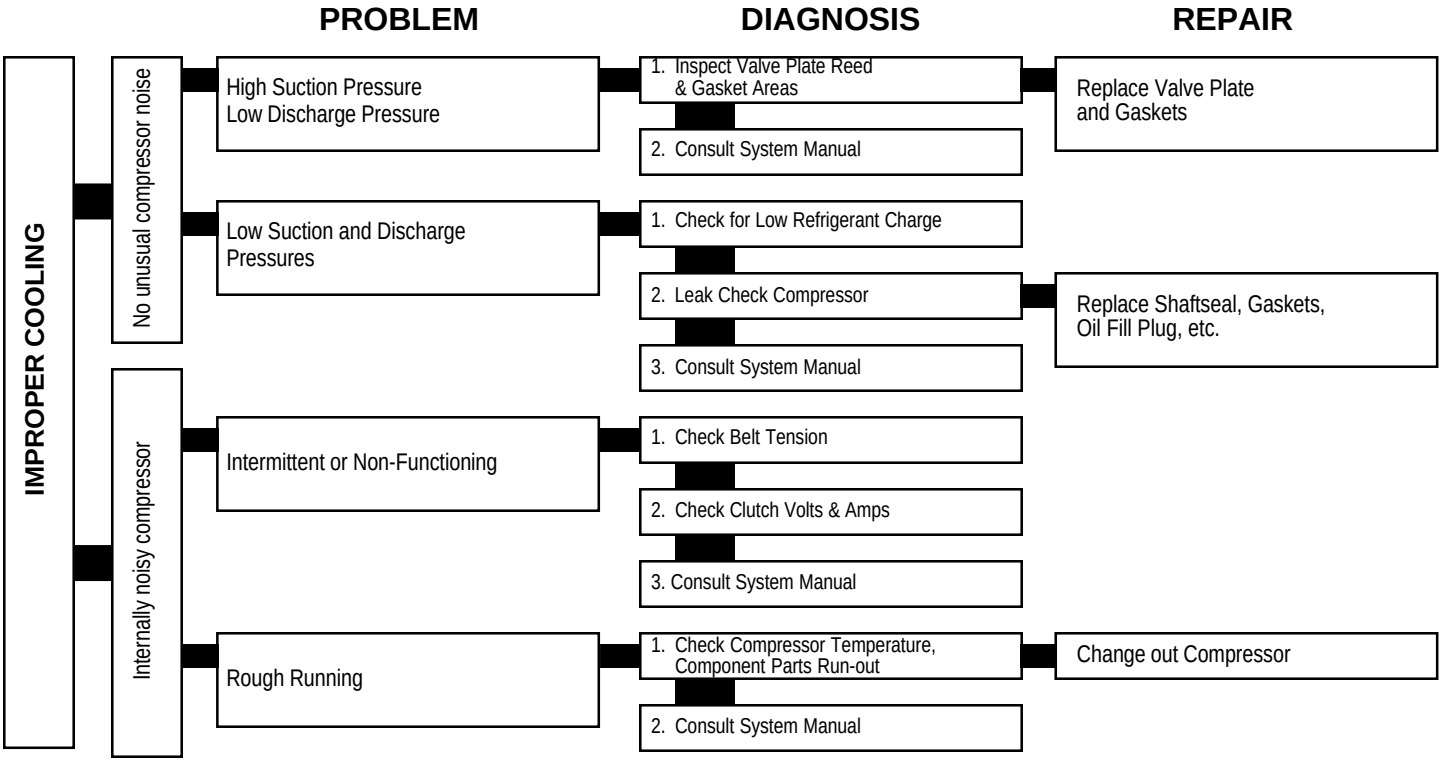


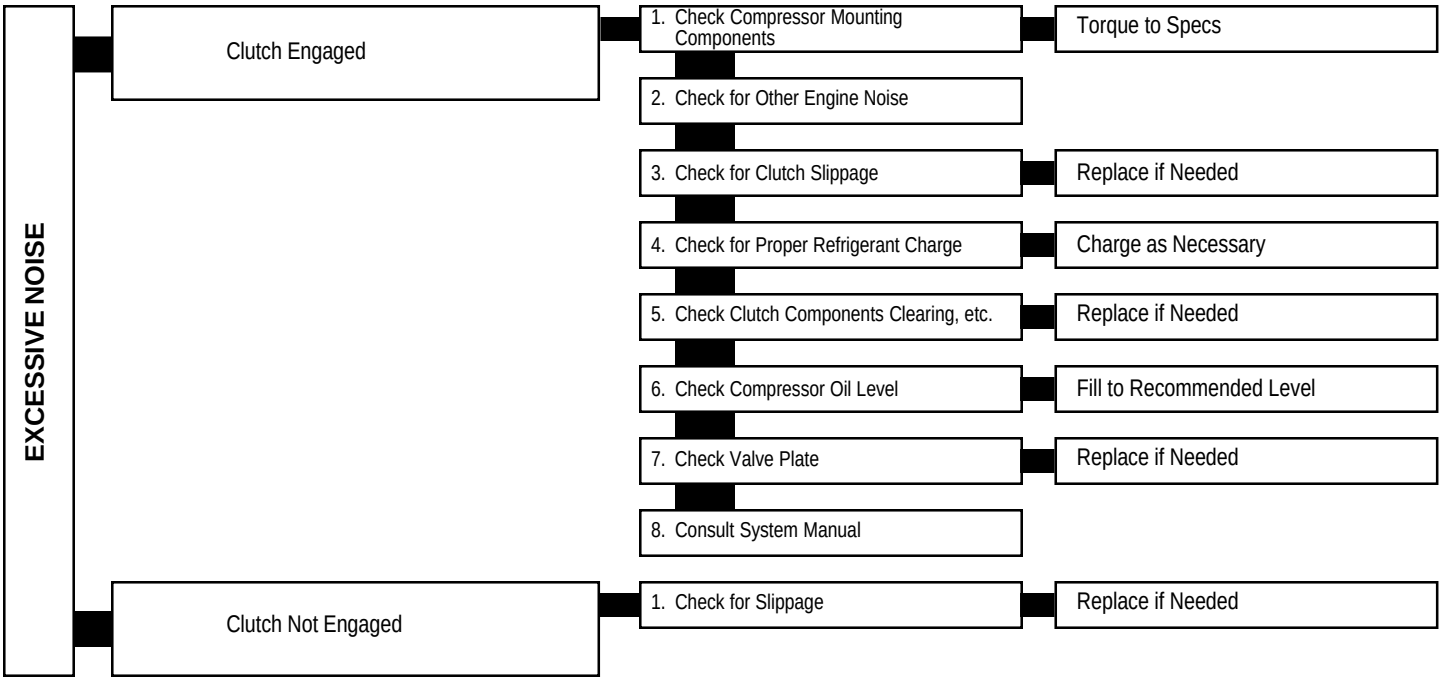
Super Compact ("Mini") Models



LOCATION	THREAD	HEAD	FIELD TORQUE SPECS
Baseplate	1/4" - 20 UNC	Hex	10-16 ft.-lb. (13.6-21.7 N-m)
Rear Bearing Cover Plate	1/4" - 20 UNC	Flat	10-16 ft.-lb. (13.6-21.7 N-m)
Cylinder Head	5/16" - 18 UNC	Hex	17-25 ft.-lb. (23.0-33.9 N-m)
Seal Plate	10-24 UNC	Hex	5-8 ft.-lb. (6.8-10.8 N-m)
Oil Fill Plug	3/8" - 24 UNF	Hex	5-10 ft.-lb. (6.8-13.6 N-m)
Clutch Mounting Screw	1/4" - 20 UNC	Hex	13-19 ft. lb. (17.6-25.8 N-m)
Clutch Center Bolt	5/16" - 24 UNF	Hex	20-25 ft. lb. (27.1-33.9 N-m)
Rotalock Valve	1" - 14 UNS	Hex	35-40 ft. lb. (47.5-54.2 N-m)
Tube 'O' Valve	1" 14 UNS	Hex	35-40 ft.-lb. (47.5-54.2 N-m)
Flange Valve	5/16" - 18 UNC	Torx	17-25 ft.-lb. (23.0-33.9 N-m)
Pressure Relief Valve	3/8" - 24 UNF	Hex	5-10 ft.-lb. (6.8-13.6 N-m)

Trouble Shooting



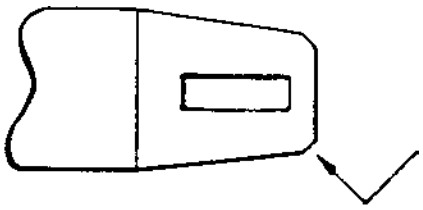


RETRO-FIX II Retrofit Procedure

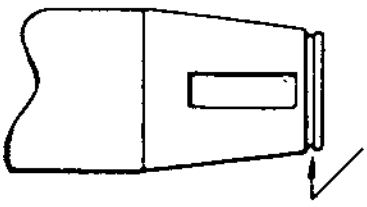
This P.O.E. (Ester) lubricant is approved for use in R-134a Climate Control 2-cylinder compressor (York) systems. It may not be suitable in other compressors. Use for oil additions in R-134a systems or for retrofitting of R-12 systems. RETRO-FIT PER VEHICLE MANUFACTURER RECOMMENDATIONS and in accordance with SAE J1661, J1660, J1639, J1629, J2197 and J1989. Barrier hoses are required for R-134a systems. Heavy-duty vehicles equipped with these hoses can normally be retrofit by following these guidelines:

1. Diagnose and repair all A/C system malfunctions, (Flush system only if contamination exists).
2. Recover the R-12 refrigerant.
3. Remove compressor and drain oil from sump.
4. Replace receiver/dryer with one containing XH-7 or XH-9 desiccant.
5. Change high and low side service ports to R-134a type by using adapters, new service valves, etc., per SAE J1660.
6. Add 14 fl. ounces of RETRO-FIX II P.O.E. (Ester) oil to compressor and install on vehicle.
7. Evacuate system (45 minutes, minimum).
8. Charge system with R-134a. (Usually 15-20% less R-134a by weight will fully charge an R-12 system.)
9. Leak test system.
10. Run system to confirm normal operation.
11. Install label to identify that the system has been retrofit per SAE J1660.

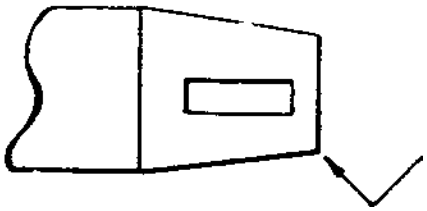
Shaft Detail Indicating Compressor Displacement



MODEL 206
.030 X 45° CHAMFER



MODEL 209
.015 DEEP GROVE



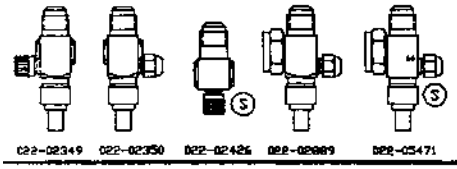
MODEL 210
SHARP CORNER

Compressor Service Valves and Fittings

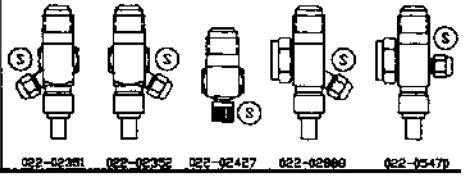
HEAVY DUTY & STANDARD COMPRESSOR VALVES & FITTINGS

ROTOLOCK — FLARE HOSE CONNECTION

1/2 FLARE (SIZE #8)

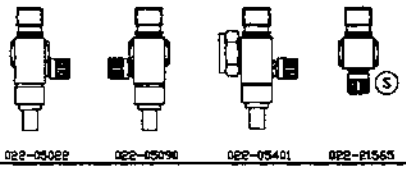


5/8 FLARE (SIZE #10)

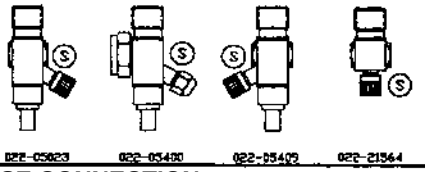


ROTOLOCK — O RING HOSE CONNECTION

1/2 O RING (SIZE #8)

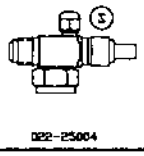


5/8 O RING (SIZE #10)

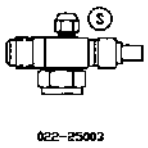


TUBE 'O' — FLARE HOSE CONNECTION

1/2 O RING (SIZE #8)

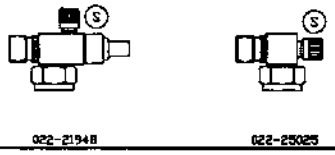


5/8 O RING (SIZE #10)

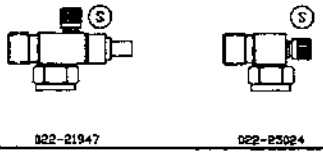


TUBE 'O' — O RING HOSE CONNECTION

1/2 O RING (SIZE #8)

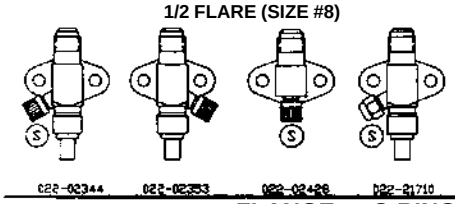


5/8 O RING (SIZE #10)

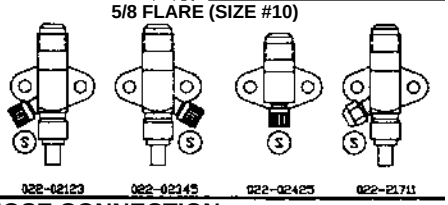


FLANGE — FLARE HOSE CONNECTION

1/2 FLARE (SIZE #8)

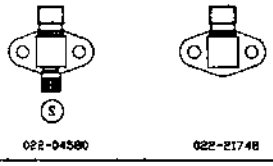


5/8 FLARE (SIZE #10)

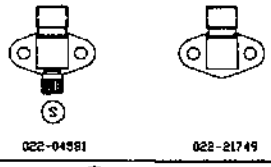


FLANGE — O RING HOSE CONNECTION

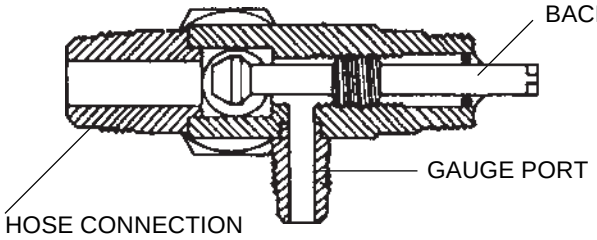
1/2 O RING (SIZE #8)



5/8 O RING (SIZE #10)

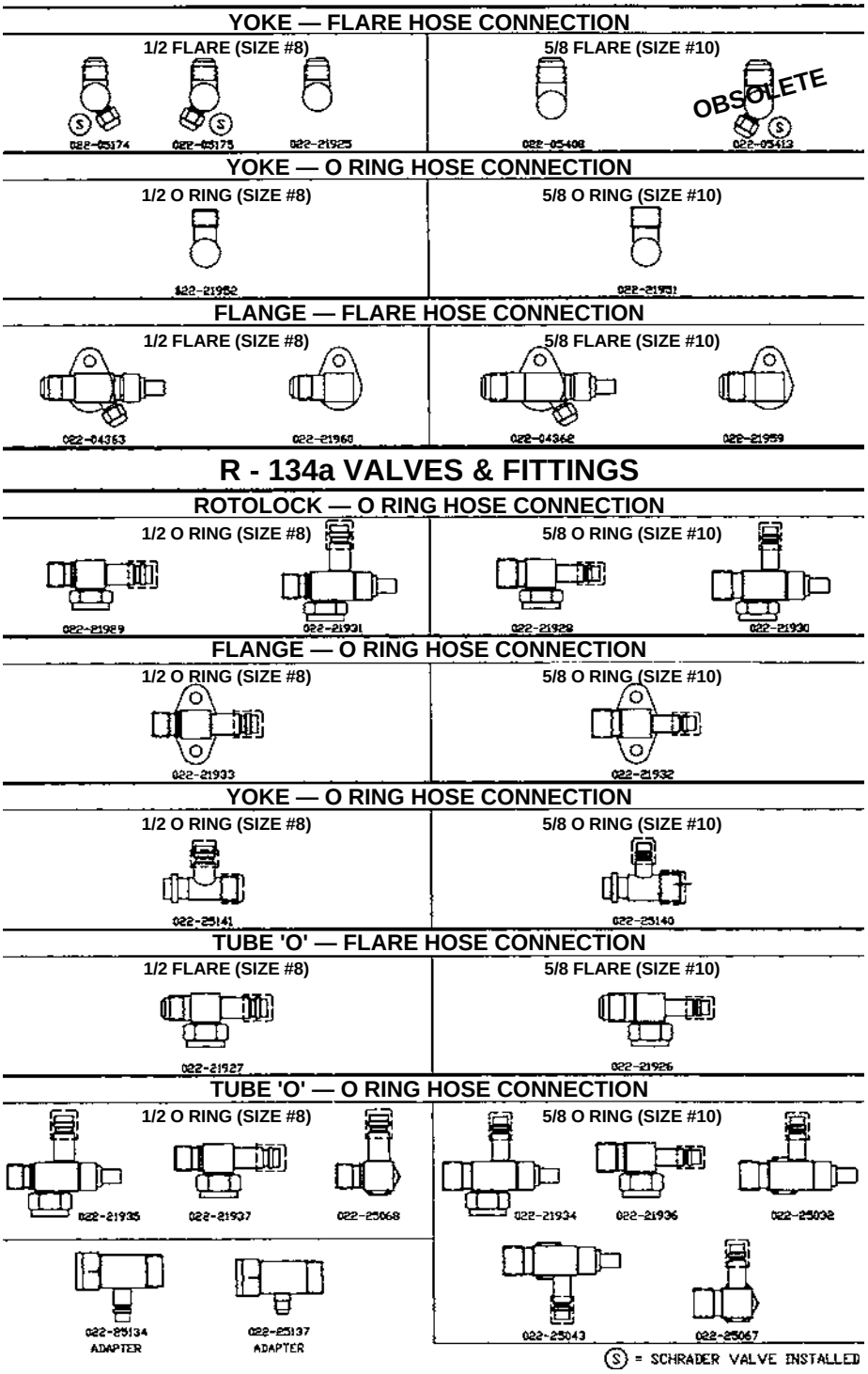


Ⓢ = SCHRADER VALVE INSTALLED



Turn valve stem all the way forward (clockwise) to shut off connecting line. This is "front seating". Turn valve stem all the way backward (counter-clockwise) to shut off gauge port and allow connection of service line (hose) to gauge port. This is "back seating". In normal operation valve stem is "back seated" to allow full flow through the valve.

SUPER-COMPACT (MINI) COMPRESSOR VALVES & FITTINGS

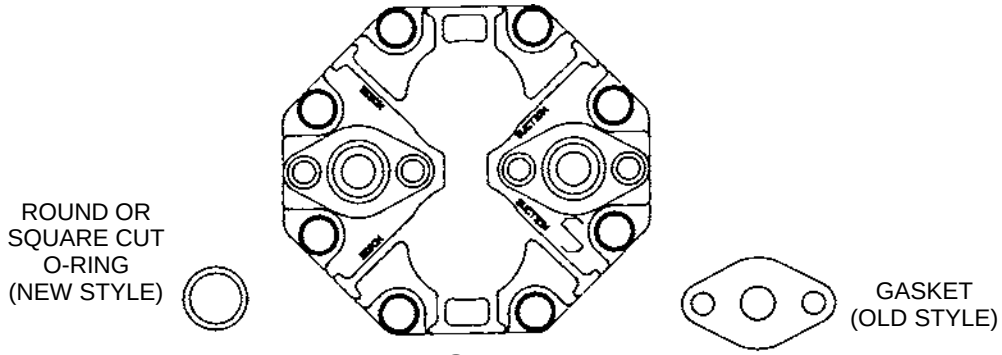


NOTE: SIZE #8 O RING HOSE CONNECTION = 3/4" - 16 UNC THREAD SIZE
SIZE #10 O RING HOSE CONNECTION = 7/8" - 14 UNC THREAD SIZE

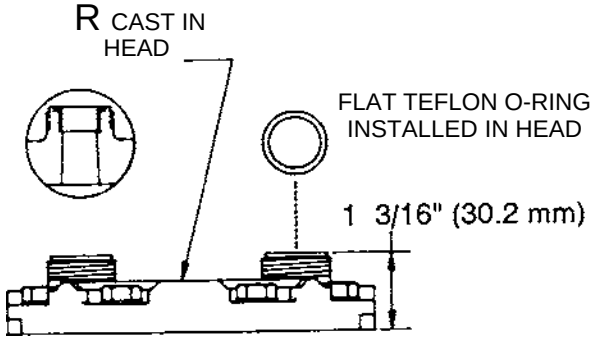
S88-21923 REV K

Service Parts

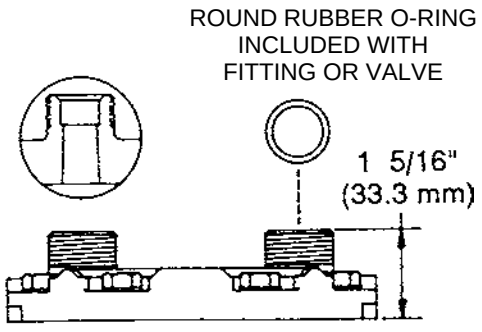
Part Number	Description
021-12373	Oil Fill Plug (all models)
022-25020	Plastic Cap For Rotalock and Tube 'O' Heads (includes rubber seal)
022-25103	16mm High Side R-12 to R-134a adapter
022-25104	13mm Low Side R-12 to R-134a adapter
026-19841	Suction Screen
028-21549	O-Ring For Oil Plug and P.R.V.
028-07146	Teflon Ring (white) 3/4" For Rotolock Heads
028-25131	Felt Ring (oil wick and dust seal)
029-25173	Oil Dip Stick
029-09888	Shaft Key
088-21831	Oil Wick Assembly (standard & heavy duty models)
388-20905	Pressure Relief Valve (P.R.V.)
488-16314	Rotolock Head Assembly W/Gaskets
488-16316	Gasket Kit - All Standard and Heavy Duty Models
488-16319	Valve Plate and Reed Assembly W/Gaskets (standard)
488-16346	Flange Head Assembly W/Gaskets
488-16999	Tube 'O' Head Assembly W/Gaskets
488-20322	SC (Mini) Flange Head Assembly W/Gaskets
488-20610	Valve Plate and Reed Assembly W/Gaskets (heavy duty)
488-20797	Gasket Kit - SC (Mini) Models
488-20798	SC (Mini) Blank Head Assembly W/Gaskets
488-20799	Valve Plate and Reed Assembly W/Gaskets (SC Mini)
488-21802	Shaft Seal Kit (Neoprene) All Refrigerants Including R-12, R-134a and Blends
488-25274	Deluxe Neoprene All Refrigerants Seal Kit W/Felt Ring, Centering Tool, Special Clutch Coil Screws
488-25080	Classic "Tool" Kit (Compressor Repair and Clutch Removal)
ESTER-25065	P.O.E. (ESTER) Oil 14 Ounce Bottles (12 to a Case) "RETRO-FIX II" Brand



FLANGE HEAD



ROTOLOCK HEAD



TUBE 'O' HEAD

cci
MANUFACTURING